

THE LISMORE METEORITIC IRON

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The Lismore meteorite is a sub-pyramidal mass of iron, with three roughly equal uneven faces (Pl. IX, fig. 1) rising from a somewhat rounded base (Pl. IX, fig. 2). Its maximum dimension is about 8 in. and its weight as received, and before cutting, was 22 lb. It was coated with limonitic scale, and exudes copious droplets of ferric chloride, which rapidly oxidizes to ferric oxide, when kept in air indoors, causing the iron to rust and scale rapidly. Polished sections rust within a few days.

The meteorite was found by a farmer, Mr. J. E. Spinks, of 'Selkirk', Lismore, in one of his paddocks about 1½ m. W. of the township of Lismore, Victoria. Mr. Spinks was removing some stones from the paddock by hand, and was amazed when 'his hand came up without this one'. He submitted the iron to Mr. H. Yates of the School of Mines, Ballarat, for determination; and Mr. Yates after recognizing it as a probable meteorite, sent it to me for determination and description.

A slice was cut from one corner by Mr. G. M. Aikenhead, of the Metallurgy Department, University of Melbourne, and was polished, buffed and etched by Mr. Travers Nicholas. Etching with a solution of 5% HNO₃ in alcohol brought up the Windmannstatten texture of a medium octahedrite (7 to 10% Ni), as shown in Pl. IX, fig. 3, with 'kamacite' lamellae 1 to 2 mm. wide, a little schreibersite, and a troilite nodule about 15 mm. diameter.

A few grams of filings were drilled from the freshly cut surface of the main mass of iron, and gave the following chemical analysis:

| | % |
|----|-------|
| Fe | 91.40 |
| Ni | 7.79 |
| Co | 0.56 |
| P | tr. |
| S | tr. |
| | <hr/> |
| | 99.75 |
| | <hr/> |

Analyst—P. J. J. Sinnott, Mineragraphic Investigations.

Polished sections under high magnifications reveal that the iron consists essentially of oriented plates of α -iron (kamacite) separated by thin residual blades of γ -iron (taenite) with much finer intergrowths of these two components (plessite) in the interstices of the coarser blades. Short irregular seams of brownish schreibersite occur occasionally in the grain boundaries of the iron.

The troilite nodule exposed in the polished slice is spheroidal and about 15 mm. in diameter. In polished section it shows prominent cleavage traces; and it is partially converted to marcasite along the cleavage planes, while the margin of the nodule shows partial conversion to marcasite and limonite.

Explanation of Plate

PLATE IX

Fig. 1.—View of 'side' of the Lismore meteorite. $\times \frac{1}{2}$.

Fig. 2.—View of the 'base' of the Lismore meteorite. $\times \frac{1}{2}$.

Fig. 3.—Etched surface of slice of Lismore meteoritic iron, showing kamacite lamellae, and interstitial areas of plessite. Portion of a troilite nodule shows on the upper right edge. Some rusting of the surface has occurred in the upper part of slice during the period between polishing and photographing. $\times 1$.